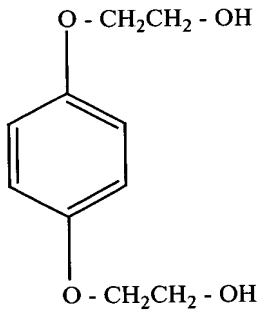
REMARKS

Claims in the case are 1, 3, 5 and 6, upon entry of this amendment. Claims 1 and 6 have been amended, and Claims 2 and 4 have been cancelled herein.

Claims 1-6 stand rejected under 35 U.S.C. §112, first paragraph. This rejection is respectfully traversed in light of the following remarks.

On page 2 of the Office Action of 3 October 2002, it is argued that Applicants have failed to clearly identify component C), in that the term "1,4-di-(2,2'-hydroxyethyl)-hydroquinone" fails to encompass the ethoxy groups within the hydroquinone. Applicants respectfully disagree. The term "1,4-di-(2,2'-hydroxyethyl)-hydroquinone" is understood by those of ordinary skill in the art to refer to a compound represented by the following general Formula A.



Formula A

Applicants wish to direct attention to column 15, line 10 of United States Patent No. 4,376,834 (**Goldwasser et al**), in which the equivalent term "p,p'-di(2-hydroxyethyl)-hydroquinone" is used. Attention is further directed to Polyurethane Handbook, 2nd Edition, Hansen Publishing, page 428 (see the appendix included herewith) in which the equivalent term "1,4-di-β-hydroxyethyl-1-hydroquinone" is used.

In light of the preceding comments, Applicants' claims are deemed to meet the requirements of 35 U.S.C. §112, first paragraph. Reconsideration and withdrawal of this rejection is respectfully requested.

Claim 6 stands rejected under 35 U.S.C. §112, second paragraph. This rejection is respectfully traversed with regard to the amendments herein and the following remarks.

Claim 6 has been amended herein to remove the term "accessory agents." Auxiliary substances that may be present in the polyurethane elastomer are described in further detail on page 6, lines 1-10 of Applicants' specification.

In light of the amendments herein and the preceding remarks, Applicants' claims are deemed to particularly point out and distinctly claim the subject matter which they regard as their invention. Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 1, 5 and 6 stand rejected under 35 U.S.C. §102(b) as being anticipated by Goldwasser et al. In light of the amendments herein and the following remarks, this rejection is respectfully traversed.

Goldwasser et al disclose polyurethane resins prepared from organic polisocyanates, polyols (e.g., polytetramethylene glycol), and a chain extender (e.g., p,p'-di(2-hydroxyethyl)hydroquinone. See the abstract; column 15, line 19; and column 15, line 10 of Goldwasser et al.

While Goldwasser et al disclose fabricating molded articles from their polyurethane resins by means of extrusion (column 11, lines 35-51), they do not disclose the preparation of a polyurethane resin itself in an extruder. The rejection does not include Claim 2, which has been cancelled, and the subject matter thereof incorporated into Claim 1 by amendment herein.

In light of the amendments herein and the preceding remarks, Applicants' claims are deemed to be unacticipated by and patentable over Goldwasser et al. Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 2-4 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Goldwasser et al. This rejection is respectfully traversed with regard to the following remarks.

Goldwasser et al has been discussed previously herein. It is argued in the Office Action of 3 October 2002 that Goldwasser et al disclose preparation of their polyurethane resins by means of an extrusion process, with reference to column 11, line 45. Applicants respectfully disagree. Goldwasser et al disclose fabricating molded articles, that include their polyurethane resins, by means of extrusion (column 11, lines 35-51). However, Goldwasser et al provide no disclosure, teaching or suggestion as to preparing a polyurethane resin itself in an extruder.

In light of the preceding remarks, Applicants' claims are deemed to be nonobvious and patentable over Goldwasser et al. Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 1-6 stand rejected under 35 U.S.C. §103(a) as being unpatentable over United States Patent No. 6,022,939 (**Pudleiner et al**). With regard to the amendments herein and the following remarks, this rejection is respectfully traversed.

Pudleiner et al disclose a thermoplastic polyurethane prepared from: (A) diisocyanates; (B) polyhydroxy compounds (e.g., polyether polyols); and (C) a chain extender that includes (C2) benzene substituted with at least two hydroxyalkyl groups (e.g., 1,4-bis(2-hydroxyethoxy)benzene, and (C3) an alkanediol with 4 to 44 carbon atoms. See the abstract; column 3, lines 28-45; and column 4, line 25 of Pudleiner et al.

Pudleiner et al does not disclose, teach or suggest preparing their thermoplastic polyurethane in the absence of component (C3) an alkanediol with 4 to 44 carbon atoms. Applicants' Claim 1 has been amended herein to include closed-end transitional language which serves to exclude other components, such as alkanediols with 4 to 44 carbon atoms.

In light of the amendments herein and the preceding remarks, Applicants' claims are deemed to be unobvious and patentable over Pudleiner et al. Reconsideration and withdrawal of this rejection is respectfully requested.

In light of the amendments herein and the preceding remarks, Applicants' presently pending claims are deemed to meet all the requirements of 35 U.S.C. §112, and to define an invention that is unanticipated, unovbious and hence, patentable. Reconsideration of the rejections and allowance of all of the presently pending claims is respectfully requested.

Respectfully submitted,

By _____
James R. Franks
Agent for Applicants
Reg. No. 42,552

Bayer Corporation
100 Bayer Road
Pittsburgh, Pennsylvania 15205-9741
(412) 777-8339
FACSIMILE PHONE NUMBER:
(412) 777-8363
s/rmc/jrf/0102

VERSIONS WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS: (Marked-Up)

Claims 2 and 4 have been cancelled without prejudice.

The following are versions of the amended claims with markings to show changes made thereto in the present Amendment.

1. (Once Amended, Marked-Up) A continuous process for the preparation of a thermoplastic polyurethane elastomer at a temperature of 130 to 250°C [comprising] consisting essentially of reacting:

A) at least one polyether diol having a number average molecular weight (Mn) of 450 to 10,000 and, on average, 1.8 to 2.2 Zerewitinoff active hydrogen atoms; with

B) at least one organic diisocyanate; and

C) 1,4-di-(2,2'-hydroxyethyl)-hydroquinone,

in the presence of 10 to 1000 ppm in relation to A) of tin dioctoate as a catalyst

with the proviso that the NCO/OH ratio of the reactants A), B) and C) is 0.85 to 1.2, said thermoplastic polyurethane having a glass transition temperature (Tg) below 50°C, and said process being performed in an extruder.

6. (Once Amended, Marked-Up) The polyurethane elastomer of Claim 5 further containing at least one [member selected from the group consisting of] auxiliary substance[s and accessory agents].

APPENDIX

Polyurethane Handbook, 2nd Edition, Hansen Publishing, page 428.

8.2.3 Properties

Thermoplastic polyurethane products were the first synthetic materials with rubber elasticity that were able to be processed by thermoplastic methods. They typically have high quality properties similar to other polyurethane elastomers (see subsection 8.4).

Figure 8.38 compares the Young's modulus of thermoplastic polyurethanes with other materials. It can be influenced mainly by the ratio of hard to soft segments. Soft products (70 to 85 Shore A) contain 20 to 25% by weight polyisocyanate, very hard products (65 to 80 Shore D) up to 55% by weight and more. The latter can only be produced with aromatic isocyanates. The stiffness of TPU products can be increased by adding fillers such as calcium carbonate, mica and talc. A sharp increase in stiffness is obtained by adding glass fibers [73, 75].

The physical properties of TPU products are known from the literature [76, 79]. This section will illustrate how the properties depend on the raw materials used.

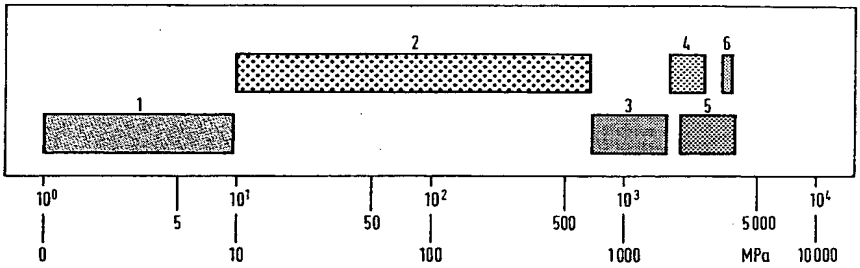


Fig. 8.38. Young's moduli of engineering plastics

8.2.3.1 Heat Resistance

The hard segment determines the material's performance at higher temperatures [3]. The highest resistance to heat is obtained with 1,4-di-ß-hydroxyethyl-hydroquinone (HQEE) as chain extender. For a series of TPUs based on MDI with different chain extenders, the heat resistance increases in the following order: 1,6-hexane diol; 1,4-butane diol; ethylene glycol and HQEE (roughly equal) (Fig. 8.39). The same relationship holds for tensile stress-strain behavior (Fig. 8.40).

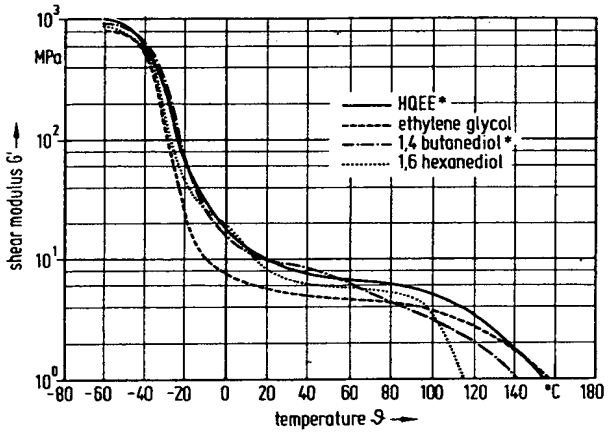


Fig. 8.39. Shear modulus G' vs. temperature to DIN 53445 of TPU based on poly (butane diol-adipate), MDI and chain extender

Polyurethane Handbook, 2nd edition, Hanser Publishers